

ABSTRACT

System and method for purifying and recycling spent brine in a water softener are provided. The system may be made up of a cation exchange resin tank fluidly coupled for passing spent brine comprising monovalent and divalent ions. A fluid mixer valve is coupled to the resin tank and to a water tank to dilute the spent brine to a desired concentration of a regenerant salt, e.g., NaCl. An ion-separation device is fluidly coupled to the fluid mixer valve to receive the diluted spent brine and separate the diluted spent brine into first and second streams. The first of the streams comprises monovalent ions and the second of the streams comprises divalent ions.